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BRANTFORD

SEWAGE TREATMENT PLANT

ANNUAL REPORT

1960

PREPARED BY

THE DIVISION OF PLANT OPERATIONS

ONTARIO WATER RESOURCES COMMISSION

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BRANTFORD SEWAGE TREATMENT PLANT

GENERAL:

Late in the year of 1956, an agreement between the City of Brantford and the Ontario Water Resources Commission was signed for the construction and operation of a sewage treatment plant. In July of 1958, a sod turning ceremony took place and construction commenced. On February 24, 1960, the sewage from the City of Brantford was directed to the newly completed sewage treatment plant and the operation of the project became a reality.

The plant consists of both primary and secondary treatment. Primary treatment consists of mechanical means for the removal of objectionable material from the sewage. At the Brantford sewage treatment plant the incoming sewage passes through bar screens, a grinding, device, grit removal units and primary settling tanks. The secondary, or "activated sludge" treatment involves the utilization of a biological floc to further reduce the amount of objectionable material. The sewage leaving the primary settling tanks enters the aeration tanks and there it is retained for about six hours while air is blown into the sewage. The mixed liquor from the aeration tanks goes to the final clarifiers. The settled solids from the final tanks are returned continuously to the aeration tanks and thus an activated sludge is built up. This activated sludge, in the presence of an adequate amount of air, is responsible for the further removal of objectionable material from the sewage. The clear effluent from the final tanks flows to a chlorine contact chamber and then to the river with 90-95% of its original objectionable material removed.

The settled solids from the primary tanks and the excess activated sludge from the final tanks are pumped to digestion tanks where their volume and organic content is reduced. As a result of the digestion, gas

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is produced which is used to heat the digestion tanks and the buildings at the plant.

A further reduction in the volume of sludge is achieved through the use of two vacuum filters. With these units the moisture of the sludge is reduced from 95% to 80% which represents a reduction in volume of about 75%. The resulting filtered sludge is trucked to farm lands or is used as land fill while the liquid that is removed is returned to the treatment process.

The consulting engineers for the project were Proctor & Redfern. The construction was carried out by Dunker Construction Ltd. while equipment was supplied by OWRC. The total cost of the project was $2,225,000.

TREATMENT UNITS:

(i) Primary Treatment

The sewage passes through a parshall flume where the flow is metered and then passes on to two rotograters which grind up solids. From here the flow passes into two wells where it is pumped by four centrifugal pumps to two detritor units on top of the main office building. The sewage flows by gravity from the detritors through the plant to the stream.

The detritors remove sand and grit from the sewage. The sand and grit is collected, hauled away and dumped.

The four primary settling tanks are each 70 feet in diameter and retain the sewage for 1 ½ hours at design flow. The settled solids in the clarifiers are pumped as sludge to the digestion tanks.

(ii) Secondary Treatment

The aeration section consists of two, three pass tanks with a total volume of 3,300,000 Imperial Gallons. Compressed air is delivered to the sewage by three air blowers of 200 hp each capable of delivering 13,800 cubic feet of air per minute.

The mixed liquor from the aeration section is divided among four final clarifiers which affords 2½ hours retention at design flow. The sludge that accumulates in these tanks is returned to the aeration section by four return activated sludge pumps.

From the final clarifiers the flow travels to a chlorine contact chamber where chlorine is injected into the sewage. The sewage is retained in the contact chamber for 15 minutes at design flow and this period is necessary for adequate mixing. The chlorine disinfects the final effluent of the plant before it is allowed to go to the river.

OPERATION:

The operation of the plant during the past year was carried out by a superintendent, five shift foremen, eleven shift operators, one maintenance mechanic, one electrical mechanic, one laboratory technician, one clerk-stock-keeper, one grounds and one buildings custodian. This gives a total staff of twenty-three men and enables the plant to be under twenty-four hour supervision seven days per week.

Many operational difficulties occurred during the year which resulted from initial start-up problems. Some experimenting, especially with the vacuum filter, was necessary in order to obtain optimum operating conditions. Most of these problems were solved by the end of the year and a more definite routine established as to the operation of the plant.

Experiments with various conditioning chemicals for the vacuum filters were carried out during the year in an attempt to obtain the cheapest means of conditioning the sludge before filtration. Some of the chemicals tested showed promise and more work in this line will be carried out in 1961.

The housekeeping and general operation of the plant was excellent during the past year. The official opening held on September 7, 1960

afforded the public the opportunity of observing a very well-kept and efficient plant. This type of care was exercised during the complete year and the results were reflected in the excellent efficient turn out by the plant.

OPERATING COSTS:

The total cost of operation of the plant for 1960 amounted to $122,860.77. The plant did not start receiving sewage until February of 1960 and vacuum filtering did not get under way until the summer. Therefore, this cost will be lower than that for a full year of operation.

The plant treated approximately 1,978,000,000 gallons of sewage from February 24th to December 31st. This represents a cost of 6.2 cents per 1000 gallons of sewage.

There was 3,639,400 pounds of BOD (1815½ tons) and 3,630,000 pounds of suspended solids (1815 ton) in the sewage entering the plant. The actual cost of handling this amount of material would then be 3.4 cents per pound.

Another way to consider cost is in relation to the population. The population of Brantford was about 53,000 for 1960. The cost of operation of the sewage plant was therefore $2.31 per person. This of course includes the cost of treating industrial wastes and will not be the actual share borne by each individual.

OPERATING COST BREAKDOWN 1960

Payroll	$85,432.00
Fuel	2,998.06
Power	19,964.31
Chemicals	7,016.21
General Supplies	2,100.29
Equipment	1,562.71

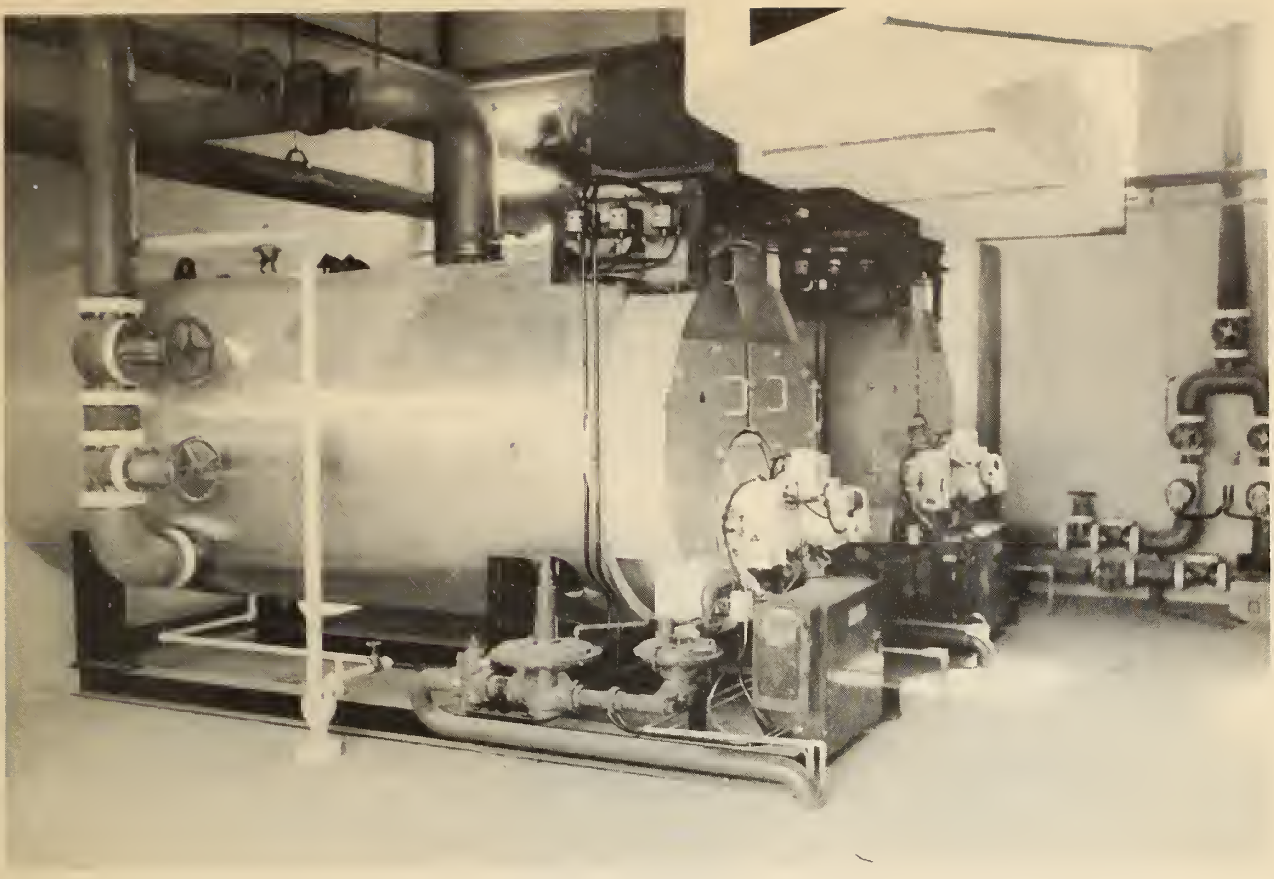
OPERATING COST BREAKDOWN 1960 - Continued

M. & R.	1,487.21
Miscellaneous	2,299.98
TOTAL	$122,860.77

The 1961 estimateis shown below and indicate an increase over 1960. This increase results from the fact that the plant did not operate for twelve months in 1960, but only for about 10½ months.

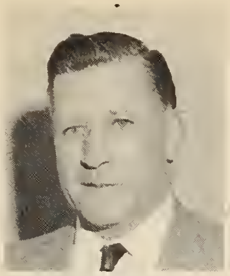
OPERATING EXPENSE BUDGET 1961

Payroll	91,160
Fuel	4,000
Power	20,000
Chemicals	15,600
General Supplies	5,500
Equipment	1,000
Maintenance and Repair	1,000
Miscellaneous	5,900
TOTAL	147,000



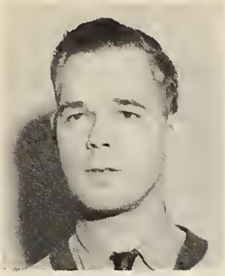
BRANTFORD

SEWAGE TREATMENT PLANT



LESLIE SHARMAN
SUPERINTENDENT

JOHN HARCOURT
SHIFT FOREMAN



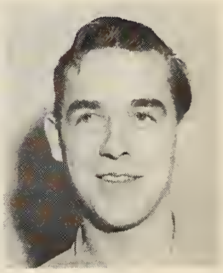
GEORGE BRAGG
SHIFT FOREMAN

WILLIAM MABBOTT
SHIFT FOREMAN

CHARLES BURNSIDE
SHIFT FOREMAN

ARTHUR SELLAR
MECHANIC

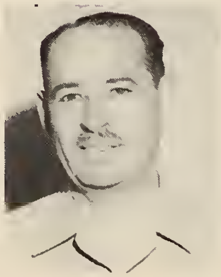
JOHN WILKINSON
ELECTRICIAN



THOMAS ALKEMA
LAB. TECHNICIAN

SHELDON NETTLETON
CLERICAL

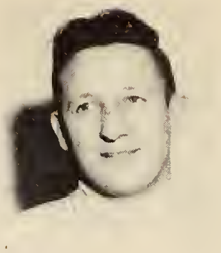
ALPHONSO ALONZO



FRED GRUMMETT

ERNEST HOSNER

EMERSON MICKS



LEONARD MILLER

GEORGE OTT

CHARLES PARSONS

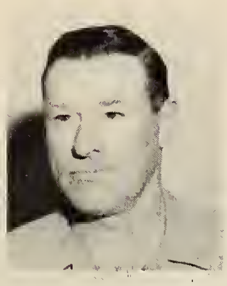
EDWARD PERCIVAL

FREDERICK ROBUS

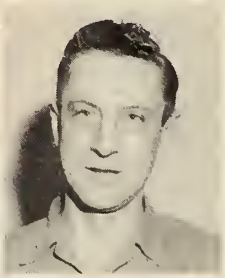
JAMES TELFER

WILLIAM BUCKINGHAM

ALLAN STAFFORD



HARRY BRADSHAW



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